

What is claimed is:

1. A compressor assembly comprising:
a compressor associated with a compressor drive means;
a cooling system positioned downstream from the compressor and configured to receive compressed fluid discharged from the compressor, the cooling system comprising:
a heat exchanger;
an air circulator configured for moving air across the heat exchanger; and
a variable speed circulator drive means operating independently of the compressor drive means; and
at least one sensor, configured to sense at least one characteristic of the compressed fluid, associated with the circulator drive means such that the speed of the circulator drive means is adjusted in response to a real-time characteristic sensed by the at least one sensor.
2. The compressor assembly of claim 1 wherein the circulator drive means comprises a variable speed frequency drive and an electric motor.
3. The compressor assembly of claim 1 wherein the at least one sensor is a temperature sensor configured to measure the temperature of the compressed fluid.
4. The compressor assembly of claim 3 wherein the at least one sensor is positioned between the compressor and the cooling system.
5. The compressor assembly of claim 3 wherein the at least one sensor is positioned downstream from the cooling system.
6. The compressor assembly of claim 3 wherein the at least one sensor and the circulator drive means are associated with a controller configured to send a control signal to the circulator drive means based on received signals from the at least one sensor.

7. The compressor assembly of claim 6 further comprising a secondary sensor associated with the controller and configured to measure an ambient temperature.

8. The compressor assembly of claim 6 further comprising a secondary sensor associated with the controller and configured to measure compressor drive means speed.

9. The compressor assembly of claim 6 further comprising a secondary sensor associated with the controller and configured to measure compressor discharge pressure.

10. The compressor assembly of claim 6 wherein the fluid discharged from the compressor is separated in a separator tank in to compressed fluid and separated lubricant and wherein the compressed fluid is directed through the cooling system and the separated lubricant is directed back to the compressor via a lubricant conduit.

11. The compressor assembly of claim 10 wherein the separated lubricant is directed through the cooling system before returning to the compressor.

12. The compressor assembly of claim 10 further comprising a valve positioned along the lubricant conduit to control the amount of separated lubricant entering the compressor.

13. The compressor assembly of claim 12 wherein the valve is associated with the controller and the amount of separated lubricant entering the compressor is controlled by the controller based on received signals from the at least one sensor.

14. The compressor assembly of claim 6 wherein the fluid discharged from the compressor is directed to a dryer.

15. The compressor assembly of claim 14 further comprising a secondary sensor associated with the controller and configured to sense at least one characteristic of the compressed fluid at an inlet to the dryer.

16. The compressor assembly of claim 15 wherein the at least one characteristic of the compressed fluid at the inlet to the dryer is one of the compressed fluid temperature, relative humidity or dew point.

17. The compressor assembly of claim 14 further comprising a secondary sensor associated with the controller and configured to sense at least one characteristic of the compressed fluid at an outlet to the dryer.

18. The compressor assembly of claim 17 wherein the at least one characteristic of the compressed fluid at the outlet to the dryer is one of the compressed fluid temperature, relative humidity or dew point.

19. The compressor assembly of claim 1 further comprising a secondary compressor and a secondary cooling system positioned downstream from the secondary compressor and configured to receive compressed fluid discharged from the secondary compressor, the secondary cooling system comprising:

- a secondary heat exchanger;
- a secondary air circulator configured for moving air across the heat exchanger; and
- a secondary variable speed circulator drive means configured to operate independently from the circulator drive means.

20. The compressor assembly of claim 19 wherein a secondary sensor is associated with the secondary circulator drive means.

21. The compressor assembly of claim 20 further comprising a controller associated with the at least one sensor, the secondary sensor, the circulator drive means and the secondary circulator drive means, the controller configured to independently control the circulator drive means and the secondary circulator drive means based on signals received from the at least one sensor and the secondary sensor.

22. The compressor assembly of claim 1 wherein the at least one characteristic of the compressed fluid sensed by the at least one sensor is one of the compressed fluid temperature, relative humidity, dew point, or compressed fluid pressure.